

WHAT IS CLAIMED IS:

1. A wireless network comprising:

a mobile node; and

a plurality of access points each of which is capable of
5 managing a radio coverage area and also capable of enabling an
impulse radio wireless link with the mobile node.

2. The wireless network of Claim 1, further comprising a
positioning network capable of determining a position of the
mobile node and also capable of informing at least a first
access point about the determined position of the mobile node,
wherein said mobile node interacting with the first access point
can now have more lead time to interact with a second access
point before said mobile node has to handoff communications to
15 the second access point.

3. The wireless network of Claim 2, wherein said
positioning network further includes a net controller capable of
determining the position of said mobile node by the interaction
20 between said mobile node and at least two reference impulse
radio units.

4. The wireless network of Claim 2, wherein said
positioning network is also capable of anticipating which access
25 point of the plurality of access points the mobile node is
heading towards by tracking the movement of the mobile node.

5. The wireless network of Claim 1, wherein said wireless network is a wireless local area network.

6. The wireless network of Claim 1, wherein said mobile
5 node is a laptop computer or a personal digital assistant.

7. The wireless network of Claim 1, wherein said mobile node can log into the wireless network only if the mobile node is located in an approved area.

8. A mobile node comprising:

an impulse radio unit capable of using impulse radio signals to interact with an access point.

9. The mobile node of Claim 8, wherein said impulse radio units is further capable of interacting with a position network that determines a position of the impulse radio unit and forwards the determined position to a first access point that informs the mobile node when the determined position of the
20 impulse radio unit is within an overlapped area of at least two radio coverage areas of at least two access points, wherein said informed mobile node having a wireless link with the first access point now has more lead time to interact with a second access point before said mobile node has to handoff
25 communications to the second access point.

10. The mobile node of Claim 9, wherein said positioning network further includes a net controller capable of determining the position of said impulse radio unit by the interaction
5 between said impulse radio unit and at least two reference impulse radio units.

11. The mobile node of Claim 9, wherein said positioning network is also capable of anticipating which access point of the at least two access points the impulse radio unit is heading
towards by tracking the movement of the impulse radio unit.

12. The mobile node of Claim 8, wherein said wireless link is an impulse radio wireless link.

13. The mobile node of Claim 8, wherein said mobile node is a laptop computer.

14. The mobile node of Claim 8, wherein said mobile node
20 is a personal digital assistant.

15. A method for improving communications within a wireless network using impulse radio technology, said method comprising the step of:

25 using impulse radio signals to enable communications between a mobile node and an access point.

16. The method of Claim 15, further comprising the steps of:

generating a map including coordinates of a radio coverage
5 area of each access point within the wireless network;

determining a position of the mobile node;

informing the mobile node when the determined position of
the mobile node is within an overlapped area of the radio
coverage areas of at least two access points;

10 enabling the informed mobile node having a wireless link
with a first access point to now have more lead time to interact
with a second access point before said mobile node has to
handoff communications to the second access point.

15 17. The method of Claim 16, further comprising the step of
tracking the movement of the mobile node so as to anticipate
which access point of the at least two access points the mobile
node is heading towards.

20 18. The method of Claim 16, wherein said step of
determining the position of the mobile node further includes
using impulse radio technology to determine the position of the
mobile node.

25 19. The method of Claim 16, wherein said step of
determining the position of the mobile node further includes
enabling the interaction between the mobile node and at least
two reference impulse radio units to determine the position of
the mobile node.

20. A wireless network comprising:

a plurality of access points each of which is capable of managing a radio coverage area and also capable of enabling a wireless link with a mobile node; and

a positioning network capable of determining a position of the mobile node and also capable of informing at least a first access point about the determined position of the mobile node; and

said mobile node interacting with the first access point can now have more lead time to interact with a second access point before said mobile node has handoff communications to the second access point.

21. The wireless network of Claim 20, wherein said positioning network further includes a net controller capable of determining the position of said mobile node by the interaction between said mobile node and at least two reference impulse radio units.

22. The wireless network of Claim 20, wherein said positioning network is also capable anticipating which access point of the plurality of access points the mobile node is heading towards by tracking the movement of the mobile node.

23. The wireless network of Claim 20, wherein said wireless link is an impulse radio wireless link.

24. The wireless network of Claim 20, wherein said wireless network is a wireless local area network.

25. The wireless network of Claim 20, wherein said mobile
5 node is a laptop computer.

26. The wireless network of Claim 20, wherein said mobile node is a personal digital assistant.

27. The wireless network of Claim 20, wherein said mobile node would handoff communications to the second access point after completion of a data transfer.

28. The wireless network of Claim 20, wherein said mobile
15 node would handoff communications to the second access point after said mobile node moves out of the radio coverage area of the first access point.

29. The wireless network of Claim 20, wherein said mobile
20 node would handoff communications to the second access point before a signal quality of the wireless link between said mobile node and the first access point degrades below a predetermined threshold.

30. The wireless network of Claim 20, wherein said first
25 access point can alert said mobile node before said mobile node travels into an area known to have interference.

31. A mobile node comprising:

5 an impulse radio unit capable of interacting with a position network that determines a position of the impulse radio unit and forwards the determined position to a first access point that informs the mobile node when the determined position of the impulse radio unit is within an overlapped area of at least two radio coverage areas of at least two access points, wherein said informed mobile node having a wireless link with the first access point now has more lead time to interact with a second access point before said mobile node has to handoff communications to the second access point.

10 32. The mobile node of Claim 31, wherein said positioning network further includes a net controller capable of determining the position of said impulse radio unit by the interaction between said impulse radio unit and at least two reference impulse radio units.

15 33. The mobile node of Claim 31, wherein said positioning network is also capable of anticipating which access point of the at least two access points the impulse radio unit is heading towards by tracking the movement of the impulse radio unit.

34. The mobile node of Claim 31, wherein said wireless link is an impulse radio wireless link.

35. The mobile node of Claim 31, wherein said wireless network is a wireless local area network.

36. The mobile node of Claim 31, wherein said mobile node
5 is a laptop computer.

37. The mobile node of Claim 31, wherein said mobile node is a personal digital assistant.

38. The mobile node of Claim 31, wherein said mobile node
10 would handoff communications to the second access point after completion of a data transfer.

39. The mobile node of Claim 31, wherein said mobile node
15 would handoff communications to the second access point after said mobile node moves out of the radio coverage area of the first access point.

40. The mobile node of Claim 31, wherein said mobile node
20 would handoff communications to the second access point before a signal quality of the wireless link between said mobile node and the first access point degrades below a predetermined threshold.

41. The mobile node of Claim 31, wherein said first access
25 point can alert said mobile node before said mobile node travels into an area known to have interference.

42. A method for improving a roaming scheme within a wireless network using impulse radio technology, said method comprising the steps of:

generating a map including coordinates of a radio coverage
5 of each access point within the wireless network;

determining a position of a mobile node;

informing the mobile node when the determined position of the mobile node is within an overlapped area of the radio coverage areas of at least two access points;

10 enabling the informed mobile node having a wireless link with a first access point to now have more lead time to interact with a second access point before said mobile node has to handoff communications to the second access point.

15 43. The method of Claim 42, further comprising the step of tracking the movement of the mobile node so as to anticipate which access point of the at least two access points the mobile node is heading towards.

20 44. The method of Claim 42, wherein said step of determining the position of the mobile node further includes using impulse radio technology to determine the position of the mobile node.

25 45. The method of Claim 42, wherein said step of determining the position of the mobile node further includes enabling the interaction between the mobile node and at least two reference impulse radio units to determine the position of the mobile node.

46. The method of Claim 42, wherein said wireless link is an impulse radio wireless link.

47. The method of Claim 42, wherein said mobile node is a
5 laptop computer.

48. The method of Claim 42, wherein said mobile node is a personal digital assistant.

49. The method of Claim 42, wherein said mobile node would
handoff communications to the second access point after
completion of a data transfer.

50. The method of Claim 42, wherein said mobile node would
handoff communications to the second access point after said
mobile node moves out of the radio coverage area of the first
access point.

51. The method of Claim 42, wherein said mobile node would
20 handoff communications to the second access point before a
signal quality of the wireless link between said mobile node and
the first access point degrades below a predetermined threshold.

52. The method of Claim 42, wherein said first access
25 point can alert said mobile node before said mobile node travels
into an area known to have interference.